TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE WYOMING SOIL CONSERVATION SERVICE

Biology No. 301 January 1986

Subject: BLUEGILL*

General

The bluegill (Lepomis macrochirus) is native from the Lake Champlain and southern Ontario region through the Great Lakes to Minnesota and south to northeastern Mexico, the Gulf states, and the Carolinas. The species has been widely introduced outside its native range. Three subspecies are currently recognized: L. m. macrochirus (north-central United States), L. m. speciosus (Texas and northern Mexico), and L. m. purpurascens (Atlantic and Gulf States).

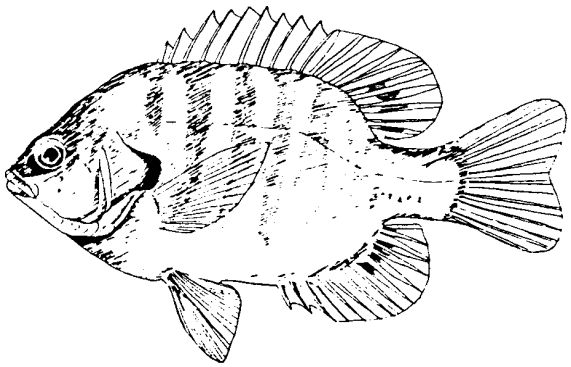
Age, Growth, and Food

Bluegills usually mature at age 1 or 2. The maximum known age is 11 years, but most live 1 to 4 years. Maximum recorded size is 39 cm and 2.1 kg.

Bluegills are opportunistic feeders which can alter their diet according to food availability. Fry feed primarily on zooplankton and small insects. Juveniles and adults feed on zooplankton, aquatic and terrestrial insects, and some plant materials.

Reproductive Requirements

Bluegills are repeat spawners and the spawning season may extend from spring through summer. Spawning occurs from 17° to 31°C with peak spawnings at 24° to 27°C. Nests are usually found in quiet, shallow (1-3 m) water. Although spawning will occur over almost any substrate, fine gravel or sand is preferred. Incubation time ranges from 1.5 to 5 days, depending on ambient water temperature.



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*Information taken from Ecoregion M3113 Handbook and Habitat Suitability Index Models, Wildlife Species Narratives (literature searches), U.S. Fish and Wildlife Service, various dates between 1978-1984.

Special Habitat Requirements

Bluegills are most abundant along shoreline areas in lentic and lentictype environments such as ponds, lakes, reservoirs, and large low-velocity streams. In riverine habitats, bluegills are mostly restricted to areas of low velocity. Optimal stream gradient (≤0.5 m/km) is based on the preference for low-gradient, lentictype waters.

Optimal lacustrine habitat is characterized by fertile lakes, ponds, and reservoirs with extensive (≥20 percent of lacustrine surface area) littoral areas. However, deeper areas are also required for overwintering and retreat from the summer heat. One study reported a significant positive correlation between TDS levels of 100-350 ppm and sportfish (including sunfishes) standing crops in a group of predominantly southeastern reservoirs.

Cover in both lacustrine and riverine habitats in the submerged vegetation or logs and brush is utilized by the species, especially juveniles and small adults. However, an excessive abundance of vegetation can inhibit utilization of prey by bluegills. Populations of stunted individuals have been associated with an excessive amount of aquatic vegetation which may inhibit the utilization of bluegills as prey. Bluegills also nest in unvegetated areas.

Water quality criteria for bluegills in both riverine and lacustrine habitats are outlined as follows: optimal growth and reproductive potential occurs in waters of low to moderate turbidities (<50 ppm). Bluegills can tolerate a pH range of 4.0 to 10.3, but pH levels at these extremes have caused at least partial kills. Optimal levels are 6.5-8.5, based on criteria for freshwater fish. Bluegills can tolerate dissolved oxygen levels < 1.0 mg/l for short durations, but will avoid levels of 1.5-3.0 mg/l. Optimal levels are > 5.0 mg/l. Bluegills will not tolerate salinities > 5.6 ppt and prefer salinity levels < 3.6 ppt.

Adult. Optimal growth of adult bluegills occurs near 27°C. No growth occurs below 10°C or above 30°C. The reported ultimate upper incipient lethal temperature for bluegill is 35°C.

Embryo. Optimal temperatures for successful embryo development are 22°-27°C, and development will occur from 22°-34°C. Optimal current velocities are < 7.5 cm/sec, and embryos are not found at current velocities > 30 cm/sec. Because bluegill spawn at 1-3 m depth, reservoir drawdown during spawning should not exceed 3 m during spring and summer.

Fry. Optimal temperatures for fry are 25°-32°C. Fry will not survive temperatures below 11°C or above 34°C. Optimal current velocities are < 5 cm/sec; fry are not found in areas with velocities greater than about 7.5 cm/sec.

Juvenile. The highest specific growth rate of juvenile bluegill occur in waters of 30°C and the growth range is 22°-34°C. Preferred current velocities are < 5 cm/sec; juveniles are not found in areas with velocities greater than about 15 cm/sec.